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NEO-REALISM AND THE ORIGIN OF CONSCIOUSNESS

TO obtain so much work or energy from a machine, so much energy must first be in. This principle of the Conservation of Energy is a regulative principle—it cannot finally decide whether any particular machine will work successfully; it only defines a general condition to which it must conform. The regulative condition that machines must be provided with as much energy as they are required to produce has not been arbitrarily assigned. All attempts to draw out more energy at the end than was there at the beginning have been futile. Thus the regulative principle of the Conservation of Energy has a reasonable warrant in an induction drawn from very extensive experience. Such regulative principles are important because they assist greatly to check fruitless search or opinion at the outset: all theories or proposals, for example, that contravene the Conservation of Energy are automatically refuted.

If it be true that consciousness is a product of evolution, an important regulative principle is supplied for studying its nature. A control is exercised over speculative thought which is far-reaching in its decisiveness against some conceptions and in the favor it shows to others. Unlike the principle of the Conservation of Energy, the principle of the Evolutionary Production of Consciousness is not based on induction. It is hypothetically formulated as a reasonable deduction from our total knowledge and experience. This deduction is, however, so reasonable, so in conformity with the broad general outline of nature and life as we know them, that it is almost a philosophical duty to assume it. If thought is undirected by some regulative principles it will be vagrant and capricious. A principle so reasonable and so illuminating as the evolutionary production of consciousness deserves, if it does not demand, recognition as a regulator of speculative thinking until it becomes evident that it is inadequate or false.

An implication, or apparent implication, of this principle is the origination of consciousness as a method of biological adjustment between the organism and its environment. The organism must maintain itself as a 'going concern.' It must find food, escape from danger and utilise any advantages offered to it by its surroundings. Plants seem to succeed in their mode of life without any conscious sense of the influences that affect them. Near the boundary between the plant and the animal it is difficult to determine whether any particular organism is one or the other. It is equally, if not more difficult to distinguish between animals which are conscious and those which are not. Man is certainly conscious; apes, dogs and numerous other animals are little less certainly also conscious. Since mental achievement progresses continuously through the animal series up to man, conscious appreciation must be supposed to extend far downwards into the lower ranges of life. Its degree of extension is indeterminate—we cannot be certain that amœbæ are conscious, though we may think from their actions that they are. Even human consciousness is largely concerned with the biological interests of the organism—with procuring food, clothing or shelter and with protection. Progressive restriction to these biological interests appears to occur as the scale of animal life is descended. Thus consciousness seems to begin in the sole service of biological interest.

The close association between conscious life and neural organisation supports the conclusion that consciousness originated as a method of biological adjustment. The brain is a mechanism lodged in the animal to receive impressions from its surroundings and initiate adequate responsive bodily actions. Consciousness is an effective addition to this mechanism. A climber sees a stone rolling down the mountain from above, fears for his life and jumps aside. Consciousness of distant movement bestows increased prevision on the organism by an extension of the original capacity of the brain to receive impressions: fear prompts the brain to use its powers of response; previous experience ensures the adequacy of the responding. The purely neural machinery could suffice for fixed situations. A collection of definite responsive movements, each connected with a particular impression on the brain, would, or might, suffice for an absolute routine. But no routine is absolute and no higher organism lives entirely in routine. The neural mechanism lays the organism open to a variety of impressions and confers upon it the control of a variety of movements. Consciousness, by conferring interpretative power, enables the animal to adapt its impressional susceptibilities to innumerable situations. It enables it to choose from its repertory of actions combinations suited to many occasions. By pain, pleasure, or emotion, it urges it both to realise and respond to its situations as they arise. Consciousness, in short, by introducing plasticity into the primary neural adjustment of action to situation, secures a more complete secondary adjustment of the organism to the complexities of life. It also compels, or induces it, by affecting it with pain or pleasure, to use this adjustment.

In man, perhaps to a less extent in higher brutes, the power of knowing conferred by consciousness partly severs its original connection with responsive action, looks beyond the mere biological interest and strives for a knowledge of reality for its own sake. This extension of conscious function emphasises its original restriction, still manifest in man's primary preoccupation with food, clothing, shelter and safety, to biological needs. If this apparent origination of consciousness as a method of biological adjustment must be accepted as the implication of the regulative principle of the Evolutionary Production of Consciousness, it, in turn, will regulate all conceptions of the nature of mind. Final events, doubtless, illuminate origins—what we become shows us what we were. But origins also determine ultimate results, and the point of departure is always important for progressive explanations because these are attached to it. The evolution of consciousness discloses some of its constituent elements by an historical analysis that isolates them for inspection in an earlier uncomplicated condition. The original and still operative function of consciousness as a method of biological adjustment has a determination on its nature and progress that psychology and philosophy must recognise.

Consciousness apparently took over a directorship already established. Plant life indicates that organisms originally maintained themselves as 'going concerns' under an unconscious form of direction. A convergence of physico-chemical processes of an organisation into a definitely recognisable individual being, a permanent eddy or whirlpool in a stream of change, had already occurred. When the more adventurous animal, moving from place to place, appeared, consciousness, with its wider adjustment of response to environmental demand, appeared also. However this original directorship of organic activities be conceived, as an automatic action of physico-chemical activities or as a vital or psychic original which did unconsciously what conscious realisation, effort and intention, subsequently imitated or enlarged, consciousness developed to occupy an office provided for it. Its nature was determined by the qualifications required for this office and, since adequacy for its primary function and not for its later duty of revealing reality to the philosopher was sufficient at first, its future course would be largely controlled by these qualifications. Beginnings may not decide all subsequency, but they do decide much of it. The original course of evolution has probably decided, for example, that consciousness is to be permanently associated with organisms constructed on the four-limb plan. Similarly, the original qualifications demanded of consciousness presumably established in it functional habits that continue in its fundamental structure and working.

The New Realist believes that sense-perception discloses to the percipient objects as they really are; representationalism believes that colors, sounds, forms (all qualities apprehended by sense) are mental versions or symbols of the realities perceived. Perception may be incomplete, as a blind man cannot see the redness of the apple which he handles and eats, but for the New Realism it faithfully presents reality. The New Realist doctrine originates in zeal for the interests of knowledge: if all perception is symbolical representation of reality it interposes a serious obstacle that requires strenuous mental effort to surmount or pierce by metaphysical insight as it seeks to dispense with symbols. The fear also haunts realism that if knowledge begins with symbolism it must end within it: a desire to guarantee a possibility of absolute knowledge at its source is the underlying motive of Neo-Realism. Now if consciousness originally adapted the actions of organisms to requirements by their environment, it only secondarily adapted them to the absolute apprehension of reality. The biologist often discovers *pre*-adaptation. Blinded animals discover dark caves where they can live unhandicapped by their loss of sight and perhaps, through compensatory increases in other senses, more effectively adapted to their surroundings than their keen-sighted competitors. The human hand, through its original adaptation to the climbing and grasping of tree life, was *pre*-adapted to that variety of grasp, touch and sensibility which played so prominent a part in the development of the human mind. If consciousness was compelled to see things as they really are to adjust organisms successfully to their environment, it was *pre*-adapted to metaphysical or absolute knowledge. There may have been no such *pre*-adaptation if a symbolical or representative appreciation of surroundings gave consciousness an adequate grip upon situations. The New Realism must either claim this *pre*-adaptation or suppose that perception passed from representationalistic habits to direct apprehension of reality. The former alternative is the more hopeful. Evolution has stamped certain methods of life irrevocably into the animal: it hardly seems possible for man to discard the four-limb design or the respiratory mode of metabolism. If consciousness began with symbolic versions of the realities to which it adjusted the organism and continued to find them adequate (nature only insists on adequacy), this representationalistic habit would probably be stamped irrevocably into its very being. Neo-Realism must certainly face the prospect of being compelled to maintain that from the first it was obligatory on consciousness to perceive things as they really are—incompletely no doubt, because only up to adequacy for biological adjustment—but none the less directly and truly. This necessity of maintaining that direct, immediate apprehension of reality is fundamental and original in perception is the more pressing because, if there has been substitution or supplementing of one perceptual habit by another, consciousness probably shows an increasing preference for the representationalistic method. Language expresses this preference by employing the symbolic word in place of the reality it represents.

It seems clear that the Neo-Realist must discover the original, fundamental element of immediate, direct apprehension in a perceiving process which has been largely organised into symbolical and conceptual thought. Science, for example, has substituted a conceptual, corpuscular world for the world of sounds, colors, tastes, smells and contacts, and it habitually thinks of these two worlds as one. It may make the task no easier when it is proposed to look for the element of immediate, direct perceptual apprehension in less developed consciousnesses, where this original element is more isolated because less complicated by an extension of symbolical or conceptual knowing. If we could live for one day the life of an amœba and bring back to our restored human consciousness the full memory of this life the problem might be no nearer solution. If the amœba has the same experiences of touch, so far as it is qualified to have them, as we have, both amœbic and human consciousness might still have the same mental version of material qualities and be representationalistic from the beginning. If the sense-experience of amœba, so far as it goes, differs from our sense-experience, both forms of experience might be differing mental versions, but both might be direct apprehensions of different items of reality: two incomplete acquaintances with reality may be very diverse. Since we are limited to observing the behavior of all organisms and compelled to base our psychical interpretations of it upon the nature of our own conscious processes, studying the evolution of consciousness is a still more indirect route to the solution of the problem of perception than a direct apprehension of all conscious processes, human and otherwise.

The origin of perception as a mode of adjustment between organism and environment is assumed by many to confirm neo-realistic estimates of its direct apprehending power. But would symbolical knowledge necessarily serve biological interests inadequately? A *hint* to the animal that it is wise to flee, a rustle in the grass, a shadow that may be cast by a foe, a distant howl, can be enough—if experiences may function as hints of one another, may not *all* experiences finally *hint* from reality without truly presenting it? A taste can impel an animal to feed or deter it from feeding without revealing to it the final reality of the thing tasted. It is enough for adequate reaction that the animal's reactions should be indexes of present or coming pain or pleasure, or that its sensations should act as psychic stimuli to organised methods of response. We refrain from kicking hard objects because they are hard, whether the quality we call 'hardness' be an item in external reality or our mental version of such an item. A mental version of a tiger could make us run. "With the development of sense-organs," writes Strong, "objects become able to evoke within the organism impressions corresponding to, if not actually resembling themselves—*signs* of their presence without—and to these signs appropriate movements were automatically attached." Strong here admits that biological adjustment does not necessitate more than perceptual *signs* to the organism. The animal certainly does not remain tied to actual experience of the objects which require it to react. As Strong immediately adds: ". . . but later unimportant objects became in their turn signs of the presence of important ones, so that instinctive acts could now be called forth by perceptions or even thoughts of objects not in themselves instinctive stimuli."[1] If conscious experiences are habitually used as cues to action or as inducements to it, it is quite possible that the most original sensations may simply intimate, induce or prompt movements that adjust the organism to its surroundings without conveying to it the impress of reality.

Life is full of detailed applications of fundamental habits of procedure. In the chemistry of the organism, for example, there are innumerable variants of a single hydrolytic process: countless different combinations are disjoined by, as it were, wedging them open with water. One fundamental organic procedure is the stimulus type of reaction, in which the animal

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[1] *The Origin of Consciousness*, pp. 172–173.

(or plant) is 'set' to respond to a touch upon the setting, as a rifle is prepared for the slight pull upon the trigger. The first office of consciousness was probably such a touching off upon the organic mechanism. If this be so, Professor Strong may err in saying: "It appears next, biologically, that the proper object of *perception* is a *thing*—an inanimate object, an animal, another human being—since it is to things that we require to adjust our relations. It is not a mere quality, such as might be given to one sense alone, but an object, appearing simultaneously to several. . . . We do not need to adjust our relations to mere qualities, and it is consequently not these in their abstractness that perception makes us aware of."[1] This assumes an equation between stimulus and reaction, and the very soul of this characteristic organic method is the absence of such an equation. The organism *reacts* to the thing but it does not necessarily receive more than a hint or provocation to react from its perceptions. If the original psychic rôle be that of stimulus, it is highly improbable that conscious experience originally does more than glimpse: it is also quite possible that there may be more hinting than actual glimpsing. Strong exemplifies, in the above statement, the fallacious initial assumption, so often made, that the completeness of organic reaction necessary for adequate adjustment must be matched or paralleled by a completeness of mental experience. Adequacy or inadequacy of movement or reaction, in all cases, finally settles the fate of the organism; it is only necessary that consciousness should place psychic stimuli appropriately. It is more important that these psychic stimuli should be delicate incentives to appropriate reaction than that they should be realistic intimations. Consciousness must begin, if it does begin with perception in a neo-realistic sense at all, with the merest modicum of it. Such a modicum would seem to be useless for applying real knowledge to biological adjustment: incomplete apprehension is imperfect and likely to result in wrong adjustment. Appropriate or adequate placing of psychical stimuli is *the* condition of organic survival—so far as consciousness contributes to it. These psychic stimuli could be effective if they were only hints from its environment to the animal's organization of reactions, and it is unnecessary to assume in them any perceptual knowing of a neo-realistic kind.

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[1] *Op. cit.*, p. 9.

The animal, indeed, is probably more concerned with its own pains and pleasures than with the real nature of their external source. The first conscious experiences, other than pains or pleasures themselves, are quite as likely to be intimations that pain must be avoided or satisfaction secured by avoiding or grasping movements as actual conveyence of external knowledge. If pain and pleasure, as is quite likely and even very probable, are the most impressive original elements of consciousness, the organism is psychically centered from the start on results wrought consciously in it by external things and not on these external things themselves. The world is represented essentially for it by the feelings of pleasure and displeasure it experiences. If these feelings are represented for it in their turn by cognitive hints, these may well represent the external world as its psychical effects. Lotze, in a sentence quoted for disapproval by Joad, kept within the positive requirements of biological adjustment when he wrote: "The entire flow of sense-presentations is an inner occurrence in our mind, and all sound and brightness are forms of the appearance under which we are conscious of the effects of stimuli quite otherwise constituted."[1] Lotze's affirmation takes us far from the first stir of conscious life, for he obviously refers to developed human consciousness, but, whether we descend to protozoön consciousness (if it exists) or ascend to higher psychical levels, there seems no *necessity* to suppose, whatever may be the truth, that biological adjustment requires more than psychical stimuli appropriately placed to secure adequate reaction. Descending to the lowest psychical levels, where knowing is presumably entirely subordinate to biological adjustment, secures a clearer realisation of the single original duty laid upon perception—the duty of stimulating adaptive reactions. The primary conscious function of mediating as a stimulus between environment and organism does not necessarily imply, as part of that function, an appreciation of anything more by the organism than conscious effects, pleasureableness and displeasurableness in particular. Strong remarks: "In my former book I supposed the distinction to be one between *phenomenal things*, which alone we directly perceive, and real things or 'things-in-themselves' (with hyphens) existent behind them. I now see that it is a distinction between *things as perception exhibits them* and *things as they really are*—the implication not being that they are not really to a very large extent as perception exhibits them."[1] But, since biological adjustment only requires things to be so exhibited by perception that appropriate actions are stimulated, it cannot be claimed that the organism must, from the start, perceive as neo-realism supposes consciousness to perceive. Consciousness primarily translates messages to the organism from outside into, 'thus shalt thou act,' and not into, 'thus shalt thou know what is really out there.'

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[1] *Essays in Common Sense Philosophy*, p. 21.

Symbols, it is often urged, must ultimately, however extended be their prolongation in a series, end in the realities they represent. The word 'landscape' represents or symbolises mental images of trees, rivers, mountains, rustlings, songs of birds and innumerable others that underlie the concept it represents and may, on occasion, rise before the vision of memory or imagination. These mental images may represent for the poet or imaginative seer some supernal world. But, however far the symbols stretch into a series, where each member represents its fellow, the series ends in perceptual experience of realities. The 'axiom' symbols must represent something symbolised, which must be unsymbolical, and finally 'real' has two implications alternative to the neo-realistic deduction. The unsymbolical terminus may lie outside consciousness and the serial symbolism within it. This is the representationalistic view: 'things-in-themselves' appear before, or are represented in, consciousness, as mental versions or symbolisms. Also, the 'affects' of consciousness, its pleasure or displeasure, may be for it the final realities: every conscious experience may mean, in the final issue, simply pleasure or pain. If the primary psychical function be one of stimulus to organic reactivity, successful adjustment, notified to consciousness essentially by satisfaction, or unsuccessful adjustment, notified by pain, is likely to be fundamental in the appreciation of reality.

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[1] *The Origin of Consciousness*, p. 7.

The narrowed field of consciousness, both in total scope and in any 'moment of experience,' which presumably characterises the beginning of psychic life, is unfavorable to neo-realistic estimates of its original function. The lighter the original psychic touch of the world upon the organism, the more it approximates to a single point of conscious contact between them, the more likely it is to be a stimulus and not a knowing: the pressure of any thing upon the body diminishes towards an acute pain and an incentive to movement as the thing dwindles to a sharp point. Restricted knowing restricts adequacy of adjustment and this restricted adequacy would be inherent in the early efforts of the organism. A stimulus simply needs to be set appropriately, and the 'trial and error' method which appears to pervade conscious life would seem to result naturally in an original functioning of consciousness as an organisation of psychic stimuli rather than as an organisation of 'knowing.' If consciousness be originally a sensitiser, an increase in the delicacy of organic reaction, its function of knowing, which it undoubtedly possesses, would seem to tend more to representationalism than to neo-realism.

Deducing primitive consciousness depends on wholesale surmise, but that surmise settles very definitely on an evolutionary expansion into the width and depth of developed mind from a small spot of consciousness. Jennings remarks that the amœba reacts to all stimuli reacted to by higher organisms—though our auditory sensations may be represented in it mechanically.[1] It may seem at first sight, if the animal is supposed to react consciously, that its 'spot' of consciousness is large enough to raise neo-realistic hopes. If it shrinks from light, responds to contact, reacts to chemical substances in a way suggestive of our smell and taste and appears to share satisfaction and dissatisfaction with us, it seems to be provided, though doubtless in miniature, with our cognitive equipment. Since it has not our provision of sense-organs, however, its consciousness is probably more "diffused"—to use Bergson's phrase. This diffusion would probably result in a greater uniformity or singleness of psychic experience than ours. There would be more likeness between the two conscious elements in the actions of avoiding light and of avoiding repelling chemical substance than if more developed sense-organs converted the two experiences, or assisted their conversion, into two distinct modes of apprehension. The relatively undifferentiated physical equipment of amœba suggests a relatively undifferentiated psychical equipment. In abstract theory, by pressing this analogy to its extreme, consciousness would begin with a single psychical element. This psychical element would permit connection between adjustive movements and various influences from the outer world by functioning as an intermediary stimulus. The rôle of stimulus, if it be applicable to the original function of consciousness, with its signification of intermediation between world and organism, conforms better with representationalistic conceptions of consciousness than with neo-realistic notions. So does the singleness of the original psychical element. An organism reacting with substantially the same avoiding movement to both light and repellent substance through a virtually identical psychic stimulus, suggests that the latter rather represents the world to the animal by hinting to it, or inciting in it, a movement of withdrawal, than informs it explicitly of the nature of that world. The neo-realist requires a difference in appreciation when the organism experiences psychically such different things as light and material contact. Similar considerations apply when the speculative rigidity of an absolutely single aboriginal psychical element is relaxed. This relaxation does permit the neo-realist to remain in the contest: slight variations in aboriginal psychic life might be slightly different direct immediate apprehensions of reality. But a relatively homogeneous, undifferentiated psychic life, accepting different impressions from without as signals for essentially the same movements in the physical organism, suggests more naturally the same representative function which representationalism affirms we discover in the developed mind.

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[1] *The Behaviour of the Lower Organisms—Amœba.*

The protozoön paramecium has virtually a single method of retreat from all undesirable situations. Jennings calls it the "avoiding action." Its normal forward swim has a swerve and the animal also rotates on its axis like a rifled projectile. Under these three movements it moves in a path spiral about a straight axis. If it swims against a drop of water containing alkali, it swims backwards, reverses its rotation and turns to one side. After this 'avoiding action' it again swims forwards, and this forward swim continues until it again swims into an unpleasant place. The 'avoiding action' is given to any repellent water area, whatever makes it repellent. Alkaline content, warm or cold temperature, illumination by light, all produce the same method of retreat.[1] Even paramecium has no absolute routine, but it has one predominant, single habit for avoiding repellent parts of its watery world. Alkali, temperature and light induce in it the same reaction. If the animal includes any conscious realisation in its reactions, it suggests a single psychical stimulus transforming differing influences from its environment into one responding movement. It suggests that as far as the animal is cognitively conscious at all it receives from diverse sources a common hint. Neo-realism can still plead that there are differences, though they may be minute, between paramecium's sensings of light, alkali and temperature; it can still plead that our more differentiated sensations, associated with differentiating sense-organs, open out these primary distinctions more widely; it cannot be refuted if it choose to say that down in this very beginning of conscious life there is direct, immediate awareness of external things, though it be restricted to faint glimpses. Paramecium may know light, temperature and alkalinity differently, though it almost certainly does not know them as we know them. Representationalism appears, however, to have the stronger case: a signal, a hint, a warning would cover all that paramecium seems psychically to require or receive.

Kirkpatrick suggests, in connection with humble animals like the amoeba, that there may not be a differentiated sensation for each stimulus.[2] If different stimuli do produce in the lowly psychic organism the same sensation, consciousness begins to settle into representationalistic habits from the first. The sensation represents a common demand made upon the organism by different environments. His further suggestion that lower animals may have occasional flashes of consciousness, raises the general question of an original intermittency in its early stages. Paramecium suggests such an intermittency. A settled, routine swim interrupted by painful stimuli very fairly describes its apparent life, though not with complete truth. Paramecia seem to collect in pleasant areas, in areas, for example, charged with carbonic acid, because they give the avoiding action when they are about to swim out of them; they appear to experience pain and live without pain rather than experience pain and pleasure. It is a familiar principle that consciousness decreases during routine and intensifies when routine is broken: monotony breeds sleep and a crash awakens the sleeper. It is probable, though not demonstrable, that consciousness began as a mere flash and progressed through a series of widely separated flashes to a series so compact as to be virtually or actually continuous. Sleep, even now, divides human consciousness into blocks by unconscious periods. If paramecium still perpetuates the original intermittency of conscious life, it gives a further pause to the neo-realist. These casual psychic flashes may convey fleeting glimpses—earnests of the perceptual vision of reality to come. More probably they essentially demand action from the organism and are effects within its psychism of environmental influence. If sensations and perceptions are psychic effects of material processes, representationalism, as the history of thought shows, is the logical outcome. Neo-realism can, no doubt, apply its doctrines of 'compresence' and the rest, designed to disallow causal action in the essential process of sensation or perception, to the most attenuated cognition. But if consciousness is originally an organisation of psychic stimuli it would be strange if, when mediating between organism and environment, it were causally related to movements of the animal and non-causally to processes in its environment.

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[1] *The Behaviour of the Lower Organisms, Paramecium.*

[2] *Genetic Psychology*, p. 42.

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